AMENDMENTS TO THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) An automatic gain control device in an orthogonal frequency division multiplexing system, comprising:

a variable gain amplifier for controlling a gain of an input signal;

an analog to digital converter for converting the input signal into a digital signal, and providing the digital signal to an energy calculator;

the energy calculator for calculating an energy of the digital signal;

a truncator for accumulating the calculated energies, finding an average thereof, and generating a Direct Current (DC) offset of the input signal;

a subtracter for subtracting a predefined reference value from the DC offset, and outputting a signal;

a pulse density modulation signal generator for processing the signal output by the subtracter to be a pulse density modulation signal; and

a[[n]]] Resistor-Capacitor (RC) filter for feeding the value output by the pulse density modulation signal generator back to the variable gain amplifier so that the value output by the pulse density modulation signal generator may be used for an automatic gain control,

wherein the predefined reference value includes a reference power generated based on a saturation to Root-Mean-Square (RMS) ratio for minimizing a bit error rate of the orthogonal frequency division multiplexing system.

2. (Cancelled)

3. (Original) The automatic gain control device of claim 1, wherein the saturation to RMS ratio includes 4.0σ.

4. (Original) The automatic gain control device of claim 1, wherein the energy for the automatic gain control is calculated for a training symbol interval of the input signal.

5. (Original) The automatic gain control device of claim 1, wherein the energy calculator finds a summation of the square of the input signal, and outputs the same as energy.

6. (Cancelled)

7. (Currently Amended) An automatic gain control method in an orthogonal frequency division multiplexing system, comprising:

(a) converting, by an analog to digital convertor, an input signal into a digital signal, and providing the digital signal to an energy calculator;

(b) calculating, by the energy calculator, an energy of the digital signal;

(c) accumulating the calculated energies, finding an average thereof, and generating a Direct Current (DC) offset of the input signal;

(d) subtracting, by a ~~subtractor~~subtracter, a predefined reference value from the DC offset, and outputting a signal;

(e) processing, by a pulse density modulation signal generator, the signal output by the subtracter to be a pulse density modulation signal; and

(f) feeding, by a[[n]] Resistor-Capacitor (RC) filter, the pulse density modulation signal back to another input signal to be provided after the above-noted input signal so that the output value may be used for an automatic gain control,

wherein the predefined reference value includes a reference power generated based on a saturation to Root-Mean-Square (RMS) ratio for minimizing a bit error rate of the orthogonal frequency division multiplexing system.

8. (Cancelled)

9. (Currently Amended) The automatic gain control method of claim [[8]]7, wherein (b) comprises: finding a summation of the square of the input signal and outputting the same as energy.

10. (New) The automatic gain control device of claim 1, further comprising an Infinite Impulse Response (IIR) filter for filtering a subtraction value output by the subtracter and outputting the filtered subtraction value to the pulse density modulation signal generator.

11. (New) The automatic gain control device of claim 1, wherein the reference power is generated according to

$$P_{ref} = 2\sigma^2$$

$$\sigma = Q_{max}/SR\_RATIO$$

$$Q_{max} = 2^{N-1}$$

where P_{ref} is the reference power, N is an Analog-to-Digital Convertor (ADC) bit resolution, and SR_RATIO is the saturation to RMS ratio.

12. (New) The automatic gain control method of claim 7, further comprising filtering a subtraction value output by the subtracter and outputting the filtered subtraction value to the pulse density modulation signal generator.

13. (New) The automatic gain control method of claim 7, wherein the reference power is generated according to

$$P_{ref} = 2\sigma^2$$

$$\sigma = Q_{max}/SR\_RATIO$$

$$Q_{max} = 2^{N-1}$$

where P_{ref} is the reference power, N is an Analog-to-Digital Convertor (ADC) bit resolution, and SR_RATIO is the saturation to RMS ratio.